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Ref: Docket No. 99-DIST-GEN-(2)

Att: Docket Unit  
California Energy Commission  
1516 9<sup>th</sup> Street, MS-4  
Sacramento, CA 95814

The Office of Ratepayer Advocates (ORA) is pleased to provide these comments (attached) to California Energy Commission's (CEC) proposed strategic plan (Plan) for distributed generation (DG) in California. ORA represents the interest of public utilities' customers in California. Our goal is to ensure lowest possible rates for consumers, consistent with safe and reliable service.

ORA supports the CEC's efforts to develop a Plan for DG in California. In doing so, ORA recommends that such Plan should 1) include all feasible DG technologies to provide consumers widest possible choices, 2) ensure that the costs and benefits of DG are equitably distributed among all users, and 3) ensure that the tariff requirements for DG implementation are comprehensive, unambiguous, and easy to administer.

ORA is committed to its regulatory mandate and would provide necessary assistance to the CEC in its effort to develop a comprehensive strategic plan for DG in California. If you have questions or need further assistance, please contact me at (415) 703-1525.

Sincerely,

Scott Cauchois, Senior Manager  
Energy Resources and Pricing Branch.

# BEFORE THE STATE OF CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of: ) Docket No. 99-DIST-GEN-(2)

Exploring Revisions to Current Interconnection ) Energy Commission Distributed  
Rules Between Investor-owned and ) Generation Strategic Plan  
Publicly-owned Utility Distribution Companies )  
And Distributed Generators )

Evaluating CEQA Procedures for Siting )  
Distributed Generation Facilities ) February 21, 2002

## COMMENTS OF THE OFFICE OF RATEPAYER ADVOCATES ON THE SITING COMMITTEE OF THE CALIFORNIA ENERGY COMMISSION DRAFT OUTLINE FOR A STRATEGIC PLAN FOR DISTIBUTED GENERATION IN CALIFORNIA

The Office of Ratepayer Advocates (ORA) provides the following comments on the Siting Committee of the California Energy Commission (CEC) Draft Outline for a Strategic Plan for Distributed Generation (Plan) in California. Implicit in our comments are two paramount concerns:

1. That any policy regarding Distributed Generation be considered in light of its cost and policy impact on the customers and ratepayers of the state's public utilities, and
2. Consistent with our first concern, that any policy regarding Distributed Generation be explicitly considered in light of Distributed Generation's capacity to be a "disruptive technology"<sup>1</sup> with regard to the ongoing operations of both gas and electric distribution companies.

Distributed Generation (DG) has the capacity to rewrite the economic relationship between traditional distribution utilities and their customers. It is imperative that the benefits promised by DG be shared throughout the economic community and that the CEC's Plan not inadvertently perpetuate the ***status quo ante*** of traditional utility operations.

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<sup>1</sup> By now, most industry observers recognize the insightfulness of Clayton M. Christensen's "The Innovator's Dilemma; When New Technologies Cause Great Firms to Fail"; Harvard Business School Press, 1997; ISBN: 0-87584-585-1; and its relevance to distributed generation.

## **I. Purpose and Scope of Distributed Generation Strategic Plan**

Any document issued by a single agency of State government will likely be a product of a somewhat circumscribed viewpoint. Therefore, in cooperation with the diverse agencies of the State, the CEC should produce a Plan that serves the interests and secures the greatest long-term benefits of all California consumers, with all its diverse constituencies and complex visions.

- The Plan should explicitly address the costs and benefits to be experienced by the customers of the state's public utilities.
- No technology should be explicitly included or excluded from the scope of this strategic planning effort. ORA supports the complete valuation of costs and benefits in a manner to eliminate technology-specific externalities.
- The Plan should not attempt to pick the "winners" and "losers" among DG technologies, but develop an informative methodology by which the most effective and efficient combinations of technologies and applications can find their own niches.
- The Plan should recognize consumer interest in clean and renewable technologies and help bring such technologies to commercial development.
- Government programs to assist in these endeavors should be demonstrably feasible and cost effective, and should seek to detect—not determine— what specific attributes consumers value.
- The CEC should use its special competencies in energy studies to bring forward a common vision of the role for DG for all Californians, based upon a properly structured critical analysis and not an exposition of policy preferences.

ORA proposes modifications to the draft outline, as follows:

### **"I. Purpose and Scope of Distributed Generation Strategic Plan**

- A. Articulate ~~the Energy Commission's~~ for the State of California a vision of the future relating to distributed generation.**
- B. Identify issues and opportunities affecting the likelihood of the vision being realized.**
- C. Recommend policies and strategies that will address the issues and opportunities that will make the ~~Energy Commission's~~ State's vision a reality.**
- D. Provide guidance to ~~other~~ all state agencies about policies and strategies within their respective jurisdictions that would contribute to realizing the vision."**

## **II. Vision, Mission and Principles**

### **1. Vision and Mission Statements**

ORA believes that creating a common vision for the development of Distributed Generation in California could be of great value to the people of California. ORA recommends that this common vision explicitly address the following issues:

- DG as a “disruptive technology.” DG is not just another technology innovation, but a fundamental challenge to an electric utility industry whose architecture is explicitly predicated on the use of a relatively small number of relatively large, “central station” generating plants. Whether the “desired future state” is a single system or a “system of systems” should not be prejudged. Neither existing market participants nor any conception of “the grid” should have any standing, other than in the context of its continuing service and value to the citizens of this state.
- Market barriers and technical interconnection standards. Breakthroughs in energy conversion and manufacturing technologies have begun to allow the mass production of “right-sized” generators for many different situations; the corresponding “mass” utilization of such generators cannot proceed until we have an electric distribution system wherein it is “as easy to plug in one more generator as it is to plug in one more toaster.”<sup>2</sup>
- Useful market forecasts. Many existing forecasts of DG market penetration have a “wouldn’t it be nice?” sensibility, or serve to hypothetically solve some identified problem. An articulate and forthcoming statement on credible penetration scenarios—with credible limits of confidence— would help eliminate some of the conflicts surrounding DG, especially interconnection standards.
- An electric system architectural migration strategy. ORA notes that some observers have suggested that DG reduces the need for particular aspects of electric distribution system reliability and power quality, while others suggest that DG increases the need for other aspects of system reliability and security. The potential costs and benefits of appropriate distribution system re-engineering should be carefully weighed against the potential costs and benefits of more diverse generation. Whatever the specific character of that “desired future state”, the specification of reasonable planning scenarios is the first step needed in order to estimate and achieve an effective, least-cost transition.
- Consumer Protection. Whatever the costs and benefits of either DG or the utility systems to interconnect it, any strategic plan for DG should explicitly recognize that the California Public Utilities Commission and, with it, the Office of Ratepayer Advocates, should be expected to fulfill their responsibilities, ensuring that such costs and benefits are allocated fairly

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<sup>2</sup> Comments of Dr. Richard Ely on behalf of ADM Associates, 1999.

among users and to ensure a reasonable policy environment wherever energy users or producers must interact with investor owned utilities.

ORA proposes modifications to the Vision Statement of the draft outline, as follows:

**Vision Statement**

**Distributed generation will be an integral part of ~~the California's~~ energy system infrastructure, providing consumers and energy providers with safe, affordable, clean, reliable, and readily accessible energy services.**

ORA proposes modifications to the Mission Statement of the draft outline, as follows:

**Mission Statement**

**It is the mission of the Energy Commission to coordinate a statewide plan and develop programs and policies in accordance with that plan that will effectively promote and deploy distributed generation technologies that benefit energy consumers ~~and the electricity grid~~ in California.**

2. Principles

ORA recommends that the Plan should specifically address the following policy issues:

- The development of “microgrids” for the use of DG is almost certainly a technological gateway to wider use of DG on a “plug-and-play” basis, and should be widely encouraged. ORA stresses the need for standards on interconnection and micro-grid models and supports these developments with continued regulatory oversight.
- The definition of a public utility is almost certainly in need of evolution, although it may yet be too early to comprehend the impact of forces the utilities and their regulators are presently facing. A comprehensive agenda should be attempted in this effort, even if a conclusion to all these questions cannot be accomplished.
- ORA stresses the need for standards on interconnection and micro-grid models and supports these developments with continued regulatory oversight.
- DG should not be singled out for heightened scrutiny or absolute criteria simply because it is new. All forms of electric generation should be responsive to increased concerns for environmental quality and all technologies should be compared equitably according to their net cost/benefit performance.

ORA has no opinion on whether it might be appropriate for the Building Energy Efficiency Standards (Title 24) to be modified to encourage distributed generation installations in new construction and major remodels. ORA believes that the “efficiency” of facilities and the “make or buy” energy decisions of tenants are distinctive sets of issues that will be settled on their own merits. Title 24 is conceivably an appropriate location to memorialize whatever policies are eventually developed.

ORA proposes modifications to the draft outline, as follows:

### **Principles**

**Deploy distributed generation only in a way that tend to preserves and enhances the environment in which people live.**

**Recognize the need for private investment. Without private investment, a self-sufficient distributed generation industry will never develop.**

**Provide consumers more choices about how to meet their energy needs, including opportunities to gain more control over energy use and expense.**

**Recognize the need for the existing electric power infrastructure to evolve over time in response to changes over time in actual economies of scale and deployment diversity of generation technologies.**

**Recognize the need for the roles and responsibilities of existing participants in the generation, transmission, and distribution services markets to evolve over time in response to changes over time in the actual economic needs and unmet satisfactions of California's energy consumers.**

## **III. DG Overview: Technologies and Markets**

### **A. Definition**

The definition of DG is one of the most critical decisions this strategic plan can make. Any one choice necessarily implies a host of other decisions concerning scope, priorities, and applications. ORA strongly recommends thoughtful, deliberate treatment of this subject, preferably attempting to reconcile numerous views with a set of related definitions that, together, do not presume to settle issues within the realm of public debate. Rather, such a set of definitions could help illuminate the substance of such disagreements, so as to eventually bring consensus to stakeholders and clarity to the final plan.

ORA reiterates its view that the essential attribute of distributed generation is its ability to be economically located close to its end users.<sup>3</sup> While a list of typical existing technologies is informative, it tends to prejudice the discussion unnecessarily to ongoing disputes, rather than focus parties attention upon higher-order issues common to all such technologies. Additionally, it is important to identify DG as related to inherently local transactions and distinguish from activities that might otherwise be construed to be in interstate commerce.

ORA proposes modifications to the draft outline, as follows:

### **A. Definition**

**Distributed generation has been defined in many ways, creating some confusion in terms of rule applicability. It is generally defined as the generation of electricity**

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<sup>3</sup> Chapter 2 of "ORA's Report on Phase I and Related Issues in the OIR into Distributed Generation," dated April 12, 2000, and filed in R.99-10-025 before the California Public Utilities Commission.

near the intended place of use. Some parties define it with size limitations, others exclude backup generation, and yet others make no distinction between generation connected to the transmission system and generation connected to the distribution system.

The Strategic Plan will assume the following definition, consistent with the CPUC's definition identified in its DG roadmap decision (CPUC Decision 99-10-065, October 1999).

Distributed generation is "~~small-scale~~ any electric generating technologies (such as internal combustion engines, microturbines, wind turbines, photovoltaics, ~~and~~ fuel cells, or others) that may be readily employed in close proximity to the end users of the electric power generated." ~~CPUC Decision 99-10-065, September 1999.~~

## **B. Technology Overview**

The Plan's technology overview should specifically address the special case of combined heat and power technologies utilizing the otherwise wasted heat from fuel cells, microturbines, small gas turbines, and reciprocating engines.

ORA proposes modifications to the draft outline, as follows:

### **B. Technology Overview**

This section will provide a brief description of each technology classified as distributed generation. Technologies to be addressed include but are not limited to:

Photovoltaics and Other Solar Electric Technologies

Wind Turbines

Fuel Cells

Microturbines and Small Gas Turbines

Stirling Engines

Reciprocating Engines

Combined Heat and Power Technologies (utilizing the otherwise wasted heat from Fuel Cells, Microturbines, Small Gas Turbines, and Reciprocating Engines)

Miscellaneous Storage Technologies

## **C. Status of DG in California**

ORA has no further comments on the draft outline concerning DG Installations or Enterprises.

## **IV. Deployment Issues and Opportunities**

ORA believes the major regulatory, institutional, market, or business development barriers currently impacting distributed generation deployment are:

- Complex Interconnection Rules And Protracted Utility Interconnection Studies. In addition to the work of its own Rule 21 workshops, the CEC should explicitly

consider the “Barriers” report of the U.S. DOE<sup>4</sup> and the efforts of the Institute of Electrical and Electronics Engineers (IEEE) Standards Coordinating Committee 21 project workgroup P1547 on the interconnection of distributed resources to electric power systems.

- “Central Plant” Architecture and Infrastructure. While it may be appropriate, in the beginning, to give consideration to minimizing the impact of DG integration on the established planning and operations of electric power system, predicted levels of DG market penetration will eventually require significant re-engineering of at least some portions of electric power systems.
- Tariffs. Pricing structure for distribution services, stand-by charges, public purpose programs, and restructuring-related energy costs, will have a significant impact on the development of DG.
- Exit Fees.<sup>5</sup> In particular, any form of “exit fee” for the right to cease purchasing energy commodity from the grid will adversely influence the introduction of DG.
- Unavailability Of “Distribution Wheeling” Tariffs. As discussed in ORA’s Comments to the CPUC in R.99-10-025, DG, which only supplies loads on the same distribution substation impose, *de minimus* costs, if any, on the transmission system. To subject such DG to federal interstate transmission charges and all of the associated regulatory burdens, is a substantial deterrent to the further development of DG.
- Alternatives To The ISO For Market Services. The availability of Distribution-level Wheeling would enable the creation of local markets for power services, thus helping to maintain elasticity of demand in wholesale markets, and help restrict the announced<sup>6</sup> intended imposition of federal regulation over DG “*no matter how small.*”

## 1. Interconnection Issues

Overall, the Plan takes a comprehensive review of DG interconnection issues, which ORA thoroughly endorse. In two cases, however, the Plan fails to consider some of the work already well under way for DG development in California. First, the CPUC’s Rule 21 for DG interconnection has already—with the CEC’s assistance—been substantially standardized throughout California; so ORA believes that a better question to ask should be “when will”, rather than “can”, interconnection rules be standardized throughout California. Second, ORA believes that it is time to make specific inquiries into the actual barriers facing potential California DG installations and also document cases where DG projects have been credibly interrupted by DG interconnection rules, study costs, or system impacts.

ORA proposes minor modifications to the draft outline, as follows:

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<sup>4</sup> U.S. Dept. of Energy, “Marking Connections”

<sup>5</sup> DWR Contracts are potential elements for exit fees.

<sup>6</sup> Comments of the California ISO to the CPUC Energy Division workshop on DG Impacts on Distribution Planning and Operations.



### A. Interconnection Issues

- When will the CPUC act to standardize ~~Can~~ interconnection rules be standardize throughout California?
- Should California support development of national interconnection standards?
- Can interconnection be made more user-friendly to the end-use consumer?
- Can a substantial amount of DG be interconnected in both radial and networked distribution systems?
- Are there safe, reliable and cost-effective interconnection solutions for radial and networked distribution systems?
- Can interconnection solutions be deployed in a timely manner?
- Is a single DG unit compatible with end-use equipment or other DG equipment?
- Have potential DG installations been postponed or abandoned due to existing or prior interconnection rules or costs?

### 2. Environmental Issues

Since preferences have already been given to clean technologies in net metering, ORA believes that a similar preference should also be extended to "clean" DG technologies.

ORA recommends that adequate consideration be given to the value of cogeneration when discussing issues such as can "DG become as clean as central plants?" ORA has found that, with combined heat and power (CHP), fuel burning DG can be cleaner, because it replaces useful heat that otherwise is produced in a building or district boiler.<sup>7</sup>

ORA proposes minor modifications to the draft outline, as follows:

### B. Environmental Issues

- Should the state continue to give preference to "clean" DG technologies?
- Can air emissions from DG become as clean as that from central station power plants by 2007?

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<sup>7</sup> For example, a kWh produced by a combined cycle gas turbine requires 7,000 BTUs of fuel input, and produces .00067 lbs of NOx. In a microturbine without heat recovery, a kWh requires 12,500 BTUs of fuel input and produces .00115 lbs of NOx. So in this case the microturbine is inferior in both fuel efficiency and NOx pollution. In the microturbine, 9088 BTUs are produced as heat. If 7000 of these otherwise wasted BTUs are used for heating (or cooling) that will displace the burning of 7778 BTUs in a boiler (at 90% boiler efficiency). Since a typical boiler produces .098 lbs of NOx per MMBTU of input, this displaces .00076 lbs of NOx that would have been produced by the boiler. So per kWh, the microturbine with heat recovery produces .00115 lbs of NOx, compared to  $.00067/.9 = .00074$  plus .00076 = .0015 lbs of NOx. (The .9 represents 10% losses in T&D from the central plant). Thus the microturbine in CHP operation produces 30% less NOx. In fuel use, the microturbine with CHP uses 12,500 BTUs, vs. 7778 at the power plant (again, with 10 % T&D losses), and the use of 7778 at the on-site boiler is a total of 15556 BTU for the same useful electricity and heat. The microturbine in CHP uses 24% less fuel.

- **Can air emissions from diesel backup generators become as clean as natural gas-fired generators?**
- **Should there be emissions credits or any other type of credit for cleaner technology?**
- **Should DG units that pollute more pay more?**

ORA proposes no specific modifications to the draft outline, regarding grid effect issues, at this time

### **3. Market Integration and Regulatory Issues**

In the CPUC's DG rulemaking, a number of issues have surfaced that may result in a broader discussion of DG. These issues include the value of and methodologies for "physical assurance"; the purpose, applicability, and structure of standby charges; the value of performance-based ratemaking in relation to DG; and the quantification and efficacy of efficiency incentives. Below, ORA suggests some specific investigations that may be as valuable to the CEC's purposes as they are to the CPUC's efforts. Additionally, ORA is concerned with CalSO claims to jurisdiction over DG on the basis of its "transmission" impacts. Therefore, ORA believes that any comprehensive study of DG include these issues.

It has also been suggested, in the CPUC D.01-01-027<sup>8</sup>, that charges such as transmission access charges, control area charges, ancillary services, and gross metering be harmonized. ORA believes that this is a good opportunity to begin looking into such issues, and recommends that they be added to the agenda.

To incorporate these concerns into the Plan, ORA proposes modifications to the draft outline, as follows:

#### **D. Market Integration and Regulatory Issues**

- **Can market rules be modified to allow DG to better participate in current markets?**
- **Can transaction costs associated with interconnecting and permitting be reduced?**
- **~~Is it in the State's interest to promote DG?~~**
- **How can tariffs and rate be designed to provide better price transparency to DG?**
- **Are there too many public subsidies being provided for DG?**
- **Should a separate market structure be created for the full range of DG technologies (i.e., DG aggregation, DG Power Exchange, etc.)?**

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<sup>8</sup> D.01-07-027, July 12, 2001, pg. 10.

- Should regulatory rules be changed to support the development of microgrids?
- Does the suspension of direct access impact the marketability of DG?
- Would Does the imposition of "exit fees" impact the marketability of DG?
- Should standards for control/communications be developed to better enable DG to participate in markets?
- Should the DG market paradigm shift towards decentralized rather than centralized control?
- Will DG customers who provide physical assurance continue to be exempt from standby charges?
- If DG owners could be assured they will continue to be exempt from standby charges into the foreseeable future, would this provide an incentive?
- Should performance based ratemaking or some other incentive be used to provide price signals to help develop the DG market?
- What incentives or price signals could we give, for those that have high efficiencies such as combined heat and power, and reliability?
- To what extent could the FERC or the CAISO hamper or promote the DG market?
- How will transmission access charges, control area charges, ancillary services, gross metering etc. affect the disposition of DG?

#### **V. through VII Potential Roles of Government and Other State Agencies in Addressing Issues and Opportunities**

1. The development of a Strategic Plan for DG would be a significant undertaking. The CEC should proceed carefully and deliberately to ensure the full integration of issues across jurisdictional lines.
2. Working groups will be needed for this effort. Caution should be exercised, however, to avoid propagating such a multitude of efforts that either the CEC loses its focus or participants exhaust their resources. We strongly recommend that no more than three parallel tracks of investigation be attempted at any one time. The principal working groups should only meet one day each month and parallel subgroups should not meet at the same time.
3. ORA envisions one possible appropriate separation of work, as follows:
  - a) Technical issues of system architecture, engineering, and development.
  - b) Legal and Institutional issues, including regulatory processes.
  - c) Business, market, and commercialization issues.

4. There will always be some issues on which consensus will not be achieved at any arbitrary date. The CEC should not presume that there is something wrong with the consensus process, and should not attempt to "achieve" any substitute.
5. ORA has been actively involved in distributed generation activity and has experience in interconnection standards, rules, and rate design for consumer protection. Additionally, ORA actively performs its statutory role and has years of expertise in analysis of consumer impact of utility rates, rules, and operational procedures.
6. A number of policy issues are being contemplated by the CPUC with respect to distributed generation in the DG Rulemaking.
7. ORA supports the need for coordination of distributed generation activities across state agencies, as well as the need for continued state regulation of self-generation DG.
8. The CEC should produce a comprehensive resource document from which the governor and/or legislature can promulgate a "state" strategic plan for DG.

ORA proposes no specific modifications to the draft outline concerning potential roles of various state agencies at this time, but offers minor modifications, regarding specific goals, as follows:

**Long-term (Beyond 10 Years):**

**Make California's energy generation and delivery system(s) the cleanest, most efficient, reliable, and affordable in the nation by maximizing appropriate use of distributed generation.**

**Mid-term (5-10 Years):**

**Reduce distributed generation equipment costs to a level that would obviate the need to provide government incentives to deploy distributed generation.**

**Enhance the emissions and efficiency profiles of distributed generation technologies such that the economics and permitting support wide-scale deployment.**

**Near-term (3-5 Years):**

**Fund research programs that will assist in the development and deployment of distributed generation technologies.**

**Undertake a series of analyses to determine market, technological, and regional potential for distributed generation in California.**

**~~Address~~ Identify and describe institutional and regulatory issues that interfere with purchasing, installation, and operation of distributed generation facilities.**

**Provide incentives that encourage the deployment of distributed generation, with additional incentives afforded to "environmentally preferred" technologies.**

**Sponsor the Establishment of a DG State Agency Coordination Group to cooperatively address distributed generation issues and ensure consistent handling of these issues throughout state government.**

**Raise consumer awareness about distributed generation.**